



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

12

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/031,438	05/23/2002	Thorsteinn Halldorsson	420/50815	6621
23911	7590	01/15/2004	EXAMINER	
CROWELL & MORING LLP INTELLECTUAL PROPERTY GROUP P.O. BOX 14300 WASHINGTON, DC 20044-4300			LAVARIAS, ARNEL C	
			ART UNIT	PAPER NUMBER
			2872	

DATE MAILED: 01/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/031,438

Applicant(s)

HALLDORSSON, THORSTEINN

Examiner

Arnel C. Lavarias

Art Unit

2872

*Handwritten signature*

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 1/22/02, 10/27/03.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 23-46 is/are pending in the application.
- 4a) Of the above claim(s) 36-39, 41, 42, 45 and 46 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 23-35, 40, 43 and 44 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 1/22/02 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election of Group 1, Claims 23-35, 40, 43-44, in the response to restriction/election requirement filed 10/27/03, is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. Claims 36-39, 41-42, 45-46 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the response to restriction/election requirement filed 10/27/03.

### ***Response to Amendment***

3. The submission of a substitute specification in Paper No. 5, date 1/22/02, is acknowledged.
4. The cancellation of Claims 1-22 in Paper No. 5, dated 1/22/02, is acknowledged and accepted.
5. The addition of Claims 23-46 in Paper No. 5, dated 1/22/03, is acknowledged and accepted.
6. The amendments to the Abstract of the disclosure in Paper No. 5, dated 1/22/03, is acknowledged and accepted.

***Oath/Declaration***

7. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

It does not identify the mailing address of each inventor. A mailing address is an address at which an inventor customarily receives his or her mail and may be either a home or business address. The mailing address should include the ZIP Code designation. The mailing address may be provided in an application data sheet or a supplemental oath or declaration. See 37 CFR 1.63(c) and 37 CFR 1.76.

It does not identify the city and either state or foreign country of residence of each inventor. The residence information may be provided on either on an application data sheet or supplemental oath or declaration.

***Drawings***

8. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description:

Figure 5- Reference numeral 50

Figure 6- Reference numeral 60.

A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

9. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description:

Page 20, line 7- Reference numerals 57, 58, 57', 58' are not in Figure 4.

Art Unit: 2872

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

***Specification***

10. The substitute specification filed 1/22/02 in Paper No. 5 has not been entered because it does not conform to 37 CFR 1.125(b) and (c) because:  
  
the statement as to a lack of new matter under 37 CFR 1.125(b) is missing.
11. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.
12. The disclosure is objected to because of the following informalities:  
  
Page 24, lines 20, 23; Page 27, line 9- ' $\lambda_1$ ' should read ' $\lambda_i$ '.  
  
Appropriate correction is required.
13. The abstract of the disclosure is objected to because of the following informality:  
  
Abstract, line 8- insert 'source' after 'and a light'.  
  
Correction is required. See MPEP § 608.01(b).

***Claim Rejections - 35 USC § 112***

14. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Art Unit: 2872

15. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

16. Claims 23-35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

17. Claim 23 provides for the use of a real video screen and scanning pulsed laser beam, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced. Claims 24-35 are dependent on Claims 23, and hence inherit the deficiencies of Claim 23.

Claims 23-35 are rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

18. Claim 27 recited the limitation that 'a frequency conversion takes place in one or several of the wavelength ranges red, green, blue.' However, it is unclear what element is performing the frequency conversion, i.e. is the frequency conversion taking place when an input light is incident on the screen hologram, or is the frequency conversion taking place upon recordation of the screen hologram, or is the frequency conversion occurring within the laser system itself to generate multiple wavelengths of light.

***Claim Objections***

19. Claims 24, 29, 32 are objected to because of the following informalities:

Claim 24 recites the limitation "the pulse duration" in line 1. There is insufficient antecedent basis for this limitation in the claim. Claims 29 and 32 are dependent on Claims 24, and hence inherit the deficiencies of Claim 24.

Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

20. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

21. Claims 23, 25-26, 30, 40, 43-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. (U.S. Patent No. 5926294), of record, in view of McGrew (U.S. Patent No. 5138471).

Sato et al. discloses a method of producing a video screen hologram (See for example Figure 16; col. 15, line 7-col. 16, line 33), the hologram being either a transmission or reflection hologram (See col. 5, lines 49-55; col. 6, lines 21-43), in which a real video screen (See 52 in Figure 16) is illuminated by narrowband light (See 31 in Figure 16; col. 16, lines 3-8), such as by a semiconductor-driven Nd:YAG laser (See col. 16, lines 3-8), to generate a hologram of the real video screen (See 43 in Figure 16), a plurality of individual recordings being made, in each case only a partial area of the real video screen

being illuminated, the partial areas of the video screen having a size that corresponds to image pixels (See for example Figure 11; Abstract), so that a video screen hologram of the entire video screen is obtained by composition of the individual recordings (See col. 15, line 7-col. 16, line 33), the illumination of the video screen being performed by scanning the substrate and holographic recording medium (See col. 15, line 40- col. 16, line 2). Further, Sato et al. discloses the video screen hologram manufactured from the above method (See 42, 43 in Figure 16; Abstract; Figure 11), wherein the video screen hologram comprises a plurality of individual recordings, in each of which a partial area of the real video screen is imaged as a hologram, an entire image of the whole video screen resulting from assembled or superimposed individual recordings (See col. 15, line 7-col. 16, line 33), the illumination of the video screen being performed by scanning the substrate and holographic recording medium (See col. 15, line 40- col. 16, line 2). Sato et al. lacks the illumination of the video screen being performed using a scanning pulsed laser beam. However, McGrew teaches a method for recording holographic images onto a holographic recording medium by recording an array of pixels (See for example Abstract), wherein a scanned pulse laser is utilized for illumination (See in particular Figure 5; col. 8, lines 19-36). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the illumination of the video screen be performed using a scanning pulsed laser beam, as taught by McGrew, in the method of producing a video screen hologram and the video screen hologram manufactured from the method of Sato et al., for the purpose of providing high-speed illumination and recording of the holograms, and reduced manufacturing times, since



high speed laser beam scanning and high pulse rates are more easily attained than high speed raster scanning movement of the holographic substrate and medium.

22. Claims 24 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. in view of McGrew.

Sato et al. in view of McGrew discloses the invention as set forth above in Claim 24, except for the pulse duration being dimensioned such that the movement of the laser beam over the video screen has substantially no effect on interference of the light waves in the hologram, the movement of the laser beam during a pulse being smaller than  $1/10$  of the wavelength. However, it is well known in the art of interferometry and holography that one must control the laser pulse width, as well as the movement speed of the workpiece upon which the interference pattern is incident upon, to avoid 'smearing' the interference fringes, and hence reducing the fringe visibility of the interference pattern. Optimal fringe visibility may be obtained by a combination of reducing the laser pulse width and reducing the movement speed of the workpiece. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the pulse duration be dimensioned such that the movement of the laser beam over the video screen has substantially no effect on interference of the light waves in the hologram, the movement of the laser beam during a pulse being smaller than, for example,  $1/10$  of the wavelength, for the purpose of optimizing the fringe visibility of the interference fringes, thus leading to the production of a bright reconstructed image.

Art Unit: 2872

23. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. in view of McGrew as applied to Claim 23 above, and further in view of Sukhman (U.S. Patent No. 4338578).

Sato et al. in view of McGrew discloses the invention as set forth above in Claim 23, except for a frequency conversion taking place in one or several of the wavelength ranges red, green, blue. However, Sukhman teaches the use of a multicolor pulsed coherent light source (See for example Figure 1) for use in full color holography, wherein the frequency conversion of red and infrared wavelengths is utilized to generate green and blue wavelengths (See col. 2, line 33- col. 3, line 34). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have a frequency conversion take place in one or several of the wavelength ranges red, green, blue, as taught by Sukhman, in the method of producing a video screen hologram and the video screen hologram manufactured from the method of Sato et al., for the purpose providing the three primary color wavelengths (i.e. red, green, and blue) for holographic recording, while maintaining the required coherence among the three wavelengths.

24. Claims 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. in view of McGrew as applied to Claims 23-24 above, and further in view of Gnädig et al. (DE19700162A1, or Gnädig 162), of record.

Sato et al. in view of McGrew discloses the invention as set forth above in Claims 28-29, except for a contact hologram or video screen plane hologram being generated. However, Gnädig 162 teaches a method for generating a holographic screen for laser front projection (See for example Abstract; Figures 1-2), wherein a contact hologram is

Art Unit: 2872

formed by contact of the diffusion screen (See 11 in Figure 1; 21 in Figure 2) with the holographic medium (See 12 in Figure 1; 22 in Figure 2). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have a contact hologram or video screen plane hologram be generated, as taught by Gnädig 162, in the method of producing a video screen hologram and the video screen hologram manufactured from the method of Sato et al. in view of McGrew, for the purpose of maximizing the amount of scattered light captured/recorded by the holographic medium, and reducing the complexity of the recording apparatus, since a separate reference beam optical system (i.e. additional beam splitters, beam steering mirrors, lenses) is not required (the reference beam is generated by the scattered light from diffusion screen itself).

25. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. in view of McGrew.

Sato et al. in view of McGrew discloses the invention as set forth above in Claim 23. Sato et al. in view of McGrew does not specifically disclose laser beams of a coherence length being generated which are greater than a difference between light paths of the object beam and the reference beam. However, as is known in the art of interferometry and holography, satisfactory holograms are obtained when the maximum optical path difference between the object and reference beams in the recording system are much less than the coherence length of the light from the laser. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the source of Sato et al. in view of McGrew generate laser beams of a coherence length

which are greater than a difference between light paths of the object beam and the reference beam, for the purpose of producing a satisfactory, usable hologram with reasonable fringe visibility.

26. Claims 33-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. in view of McGrew as applied to Claim 23 above, and further in view of Arns et al. (U.S. Patent No. 4456328).

With regard to Claim 33, Sato et al. in view of McGrew discloses the invention as set forth above in Claim 23, except for a repeated scanning of the video screen surface taking place by means of a respectively phase-shifted laser beam. However, Arns et al. teaches a hologram-forming system (See for example Figure 5) for producing diffusion type holograms, wherein a phase-shifted laser beam (See for example col. 2, lines 20-51) is used to record the holograms. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the a repeated scanning of the video screen surface taking place by means of a respectively phase-shifted laser beam, as taught by Arns et al., in the method of producing a video screen hologram and the video screen hologram manufactured from the method of Sato et al. in view of McGrew, for the purpose of reducing or eliminating spurious hologram recordings caused by unwanted reflections from the surfaces of the optical elements in the system.

With regard to Claim 34, Sato et al. in view of McGrew discloses the invention as set forth above in Claim 23, except for the distribution of the lumination in the hologram being measured to correct lumination in a subsequent lumination cycle. However, Arns

et al. teaches a hologram-forming system (See for example Figures 5 and 7) for producing diffusion type holograms, wherein a phase-shifted laser beam (See for example col. 2, lines 20-51) is used to record the holograms. Further, photodetectors (See for example 204, 206) are utilized within the optical system as optical beam pick-up for the reference and object beams so that a comparison may be made with respect to each beam's intensity for feedback during subsequent hologram writing cycles (See col. 7, line 36-col. 8, line 42). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the distribution of the lumination in the hologram being measured to correct lumination in a subsequent lumination cycle, as taught by Arns et al., in the method of producing a video screen hologram and the video screen hologram manufactured from the method of Sato et al. in view of McGrew, for the purpose of providing optical feedback and reduce the optical system's dependence on the source's absolute power output.

27. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. in view of McGrew as applied to Claim 23 above, and further in view of Hariharan (P. Hariharan, 'Optical holography: Principles, techniques, and applications', Cambridge University Press, Cambridge, 1996, pp. 69-84, 181-184.).

Sato et al. in view of McGrew discloses the invention as set forth above in Claim 23, except for the plural luminations being carried out with mutually perpendicularly polarized energy beams to produce two mutually independent screen images in the hologram. However, Hariharan teaches the use of standard polarization recording techniques for recording multiple holograms of varying polarization characteristics onto a

holographic recording medium (See pp. 181-184). For example, Hariharan teaches a particular arrangement (See Figure 11.1 on Page 182) wherein orthogonally polarized reference beams are used to record two holograms, each having characteristics of one of the two orthogonal polarizations (See Section 11.1.1 on Page 181). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the plural luminations be carried out with mutually perpendicularly polarized energy beams to produce two mutually independent screen images in the hologram, as taught by Hariharan, in the method of producing a video screen hologram and the video screen hologram manufactured from the method of Sato et al. in view of McGrew, for the purpose of precisely recording and recreating the polarization state of the object beam, which is generally lost in normal holographic techniques.

### *Conclusion*

28. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

P. Hariharan, 'Optical holography: Principles, techniques, and applications', Cambridge University Press, Cambridge, 1996, pp. 69-84, 181-184.

Hariharan is being cited to evidence various characteristics of polarization-based holography (See pp. 181-184), temporal and spatial coherence requirements for proper holographic recording (See pp. 75-78), and holographic recording using pulsed sources (See pp. 81-84).

U.S. Patent No. 6392766 to Gnädig et al.

Art Unit: 2872

U.S. Patent No. 6392766 is the U.S. Patent associated with Gnädig et al.  
(DE19700162A1, or Gnädig 162).

U.S. Patent No. 4586780 to Chern et al.

Chern et al. is being cited to evidence the use of diffusive screens, such as ground glass screens, as display screens (See for example col. 1, lines 26-43).

29. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arnel C. Lavarias whose telephone number is 703-305-4007. The examiner can normally be reached on M-F 8:30 AM - 5 PM EST. **Please note that after January 20, 2004, the examiner may be reached at the new telephone number: 571-272-2315.**

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 703-305-0024. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1782.



Arnel C. Lavarias  
1/2/04

